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NATIONAL INSTITUTIONAL RANKING FRAMEWORK (NIRF)

Starting this year, the National Institutional Ranking Framework (NIRF) will award negative scores to higher educational institutions for papers that have been retracted from journals in the last three calendar years and their corresponding citations.

- The NIRF is an initiative by the Indian government to **assess and rank higher education institutions** in the country.
- It was launched in **2015 by the Ministry of Education.**
- It outlines a **methodology to rank institutions** across the country on the basis of defined **parameters including:**
    - **Teaching, Learning,** and **Resources**
    - **Research and Professional Practices**
    - **Graduation Outcomes**
    - **Outreach and Inclusivity**
    - **Perception**
- Every year the Ministry releases NIRF rankings in **different categories,** including- **Overall Ranking, University Ranking**, **Engineering** Ranking, **College Ranking**, **Management** Ranking, **Pharmacy** Ranking, **Law** Ranking, **Agriculture** and Allied Sectors, **Architecture** Ranking, **Medical** Ranking, **Dental** and **Research**
- Furthermore, for a simplified approach, the **institutions are grouped as Category A (Institutions of National Importance, State Universities, Deemed-To-Be-Universities**, **Private Universities, and Autonomous institutions**), and **Category B** (Institutions **affiliated with a university).**
- It aims to f**acilitate students to make informed decisions** about their education and encourages institutions to improve their standards and quality.
- Each institute and university is evaluated and assessed every year, and the NIRF rank is **updated annually.**

Key highlights of NIRF 2024 Rankings:

- MoE released the **ninth edition** of NIRF in August 2024.
- The NIRF 2024 rankings have seen an increased participation of institutions over the years.
- From 3,500 institutions in its inaugural year to **over 6,500 unique institutions** participating across **16 categories** in 2024, there has been an impressive **86 percent increase** in participation.
- **IIT Madras** retains its **1st position in the Overall Category** for the sixth consecutive year, i.e., 2019 to 2024, and **in Engineering for the 9th consecutive year,** , i.e. from 2016 to 2024.
- **Indian Institute of Science, Bengaluru tops the Universities Category** for the ninth consecutive year, i.e., from 2016 to 2024. It stood **first in the Research Institutions Category** for the fourth consecutive year, i.e., from 2021 to 2024.
- **IIM Ahmedabad tops in the Management** subject retaining its first position for the fifth consecutive year, i.e., from 2020 to 2024.
- **AIIMS, New Delhi**, occupies the **top slot in Medical** for the seventh consecutive year, i.e., from 2018 to 2024.
- **Jamia Hamdard**, **New Delhi**, tops the ranking in **Pharmacy** this year.
- **National Law School of India University, Bengaluru,** retains its first position in **Law**.
- The **Saveetha Institute of Medical and Technical Sciences, Chennai,** takes the top slot in **Dental subject** for the third consecutive year.
- **Indian Agricultural Research Institute, New Delhi,** takes the top slot in **Agriculture and Allied Sectors** for the second consecutive year.
- **IIT Roorkee** retained its 1st position in **Architecture and Planning** for the fourth consecutive year.
- **IIT Kanpur** tops in the **Innovation category.**

EUROPEAN FREE TRADE ASSOCIATION (EFTA)

- It is an **intergovernmental organisation** established in **1960** by the **Stockholm Convention.**
- **Objective**: **Promotes free trade and economic integration** between its members within Europe and globally.

Member Countries:

- There were 7 founding countries: Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom (UK).
- They were joined in 1970 by Iceland, in 1986 by Finland, and in 1991 by Liechtenstein.
- Meanwhile, in 1973, Denmark and the UK joined the **European Union (**EU); in 1986, Portugal joined the EU, and, in 1995, Austria, Finland, and Sweden joined the EU, consequently leaving EFTA.
- EFTA **currently has 4 member countries: Iceland, Liechtenstein, Norway, and Switzerland.**
- The four EFTA States are all open, competitive economies **committed to the progressive liberalisation of trade** in the multinational arena and in free trade agreements (FTAs).

- The association is **responsible for the management of:**
  - the **free trade between the EFTA countries**;
  - **EFTA's participation in the European Economic Area (EEA**), which **includes the European Union and three EFTA countries (Iceland, Liechtenstein, and Norway,** but **not Switzerland**);
  - **EFTA's worldwide network of FTAs.**

- In contrast to the European Union (EU), EFTA is **not a customs union**. This means that the individual EFTA States are **free to set their own customs tariffs** and arrange other **foreign trade measures vis-à-vis the non-EFTA States.**
- The EFTA countries have **developed one of the largest networks of FTAs**. These FTAs span over 60 countries and territories, including the EU.
- **Governance Structure:**
    - Its **highest governing body** is the **EFTA Council.** It generally meets 8 times a year at the ambassadorial level and twice a year at the ministerial leve
    - The headquarters of the **EFTA Secretariat** is located in **Geneva**. It assists the EFTA Council in the management of relations between the 4 EFTA States and deals with the negotiation and operation of EFTA's FTAs.
    - **EFTA Surveillance Authority (ESA):** It **monitors compliance with EEA rules** in Iceland, Liechtenstein, and Norway.
    - **EFTA Court**: It is based in **Luxembourg** and has the competence and authority to **settle internal and external disputes** regarding the implementation, application or interpretation of the EEA agreement.
        - Its **jurisdiction** corresponds **to that of the Court of Justice of the European Union in matters relating to the EEA EFTA countries.**

EXERCISE PRACHAND SHAKTI

- It was conducted by the **Indian Army** at the **Kharga Corps Field Training Area, in Uttar Pradesh's Meerut.**
- The exercise focused on the **employment of disruptive technologies by infantry units in Strike Corps operations**, showcasing the Army's technological transformation in real-time combat scenarios.

- The **core objective** of the event was to **demonstrate how such disruptive technologies** can significantly **enhance the agility, lethality, and survivability** of infantry formations engaged **in deep offensive missions conducted by Strike Corps.**
- This event highlighted the **changing dynamics of warfare,** where Unmanned Aerial Vehicles **(UAVs), AI-enabled systems, loitering munitions**, and **autonomous platforms** are playing a pivotal role in redefining operational capabilities.
- This demonstration was **part of the Indian Army's broader initiative under the 'Year of Tech Absorption'**, aimed at integrating indigenous and advanced technological solutions from civilian innovators into military operations.

INDIAN ASTRONOMICAL OBSERVATORY (IAO)

- The Indian Astronomical Observatory, also known as the **Hanle Observatory,** is located in the **Hanle Valley, Ladakh.**
- It is situated at an altitude of **4500 metres above mean sea level** to the north of Western Himalayas.
- Inaugurated in 2001, the observatory is **run by Bengaluru's Indian Institute of Astrophysics (IIA).**
- The site is a **dry, cold desert** with s**parse human population** and the **ancient Hanle monastery** as its **nearest neighbour.**
- The **cloudless skies and low atmospheric water vapour** make it one of the **best sites** in the world **for optical, infrared, sub-millimetre, and millimetre wavelengths.**
- It houses a **2-meter aperture Himalayan Chandra Telescope (HCT),** which is remotely **operated from the Centre for Research and Education in Science and Technology (CREST) in Bengaluru.**
- It also features a **solar power plant,** satellite-based communication systems, and a **liquid nitrogen plant for cooling detectors.**

- Hanle is also home to a **unique Dark Sky Reserve designated by the International Dark-Sky Association.**
    - A Dark Sky Reserve is a designated area that **aims to preserve** and protect the **quality of its night skies by minimising light pollution.**
    - Dark Sky Reserves are typically located in areas with **exceptional natural darkness and starry skies.**
    - And Hanle, with less than 1000 people living in the village, is the perfect area.

THE ANTIMATTER PUZZLE OF THE UNIVERSE

Matter and Antimatter

- Matter is what makes up everything we see around us—people, planets, stars—composed of particles like protons, neutrons, and electrons.
- Antimatter is like matter's mirror image: for every matter particle, there's a corresponding antiparticle with the same mass but opposite charge.
- For example:
    - The antiparticle of an electron (negative charge) is a positron (positive charge).
    - The antiparticle of a proton is an antiproton, with negative charge.
- When a particle and its antiparticle meet, they annihilate, releasing energy.

Why the Universe Has More Matter Than Antimatter?

- The Big Bang should have produced equal amounts of matter and antimatter, but today, the universe is overwhelmingly made of matter.
- This imbalance remains one of science's greatest mysteries. A key to understanding it lies in a phenomenon called **CP violation**—where the universe treats matter and antimatter differently.
    - CP stands for **charge conjugation** (swapping particles with their opposites) and **parity** (mirror flipping left and right).
        - Charge conjugation involves replacing every particle in a system with its antiparticle.

        - For example, an electron would be replaced with a positron, a proton with an antiproton, and so on.
    - CP symmetry implies that physical laws should remain the same when a particle is replaced by its antiparticle and its spatial coordinates are inverted.
- If both symmetries held perfectly, matter and antimatter would behave identically.
- However, experiments have shown that CP symmetry can be broken.
- This violation is essential to explaining how the early universe ended up with more matter than antimatter.

First Observation of CP Violation in Baryons

- Until now, CP violation had only been observed in mesons—particles made of a quark and an antiquark.
- For the first time, scientists have detected **CP violation in baryons**, which are three-quark particles like protons and neutrons that make up most visible matter.
- The breakthrough came from studying the decay of the **Λb^0 baryon**.
    - The Λb^0 baryon is a subatomic particle known as a "**bottom lambda baryon**."
    - It's a type of baryon, meaning it's composed of three quarks, and it contains one up quark, one down quark, and one bottom quark.
    - The "0" in Λb^0 indicates that it is electrically neutral.
    - This particle is also sometimes referred to as an "open-beauty baryon".
- Researchers found that these two decayed differently into a proton, a kaon, and two pions, providing the first evidence of CP violation in baryon decays and offering new insight into the matter-antimatter imbalance in the universe.

How Scientists Observed CP Violation in Baryon Decay?

- The discovery was made at Europe's Large Hadron Collider (LHC) using the LHCb detector, which recorded data from billions of proton-proton collisions over several years.
- These collisions occasionally produced Λb^0 baryons and their antiparticles (Λb^0-bar).
- Scientists then compared how often each version decayed into those particles. A difference in decay rates, after correcting for experimental biases, indicated CP violation.

DIRECTIVE ON SUGAR, SALT LABELLING IN PACKAGED FOODS

- The Union Health Ministry has proposed the installation of sugar and oil content display boards in schools, offices, and public institutions to raise awareness about hidden fats and sugars in everyday foods.
- These boards are intended to act as visual behavioural nudges encouraging healthier dietary choices.
- The proposal also includes printing health messages on all official stationery—such as letterheads, envelopes, notepads, and folders—to serve as daily reminders in the fight against obesity.

Warning Labels Aimed at Tackling Rising Lifestyle Diseases

- The Health Ministry has introduced warning labels on food items to raise public awareness and encourage moderation in consumption.
- This initiative comes in response to a sharp rise in non-communicable diseases (NCDs), which now account for over 66% of deaths in India, particularly affecting those above the age of 30.
- Conditions such as heart disease, diabetes, respiratory illnesses, and cancers are becoming major public health concerns.
- Experts highlight that excess intake of sodium, added sugars, refined oils, and sugary drinks—often marketed as healthy—contribute to poor metabolic health.
- Additionally, many people fail to consume enough fibre, fruits, vegetables, whole grains, and fermented foods, further worsening nutritional gaps.
- Even functional snacks, which claim to offer health benefits, can contribute to these risks.

How Nutrient Values Are Measured and Why It Matters

- Nutrient values of food are determined through laboratory analysis of prepared foods and presented per 100 grams for clarity.
- These assessments focus on total sugar, saturated fat, and salt content. When lab testing isn't feasible, values are estimated using ingredient data from the **Indian Food**

Composition Tables (IFCT), published by ICMR-NIN (Indian Council of Medical Research (ICMR) and National Institute of Nutrition).

- The 2024 Dietary Guidelines for Indians define **High Fat, Sugar, and Salt (HFSS) foods** as those where sugar provides over 10% of energy, fat exceeds 15%, and salt exceeds 625 mg per 100g.
- Such foods, often highly processed and nutrient-poor, contribute to obesity, diabetes, and heart disease.

Unhealthy Snacks: It's About Content, Not Origin

- Any food—whether Indian or Western, homemade or packaged—can be unhealthy if it contains excessive sugar, salt, or fat.
- According to experts, the focus should be on a snack's nutritional profile rather than its type or origin.
- The Health Ministry's efforts aim to raise awareness and encourage healthier choices through non-punitive behavioural nudges.
- These initiatives align with broader programmes like **Eat Right India**, **Poshan Abhiyaan**, **Fit India**, and **the National NCD Control Programme**, all aimed at promoting informed food decisions and improving public health.

Guidelines on Sugar and Salt Intake for a Healthier Life

- The World Health Organization recommends a balanced diet to prevent malnutrition, non-communicable diseases like heart disease and diabetes, and to boost overall immunity.
- For Indian adults, the advised daily intake is less than 65 grams of total fat, under 25 grams of added sugar, and below 5 grams of salt.
- Children have specific limits based on their age. Nutrition experts stress the importance of building meals around fibre-rich foods, local produce, lean proteins, and healthy fats.
- They encourage home-cooked meals, mindful eating, and consistency in healthy choices over rigid dieting trends for long-term well-being.